Switchgear Temperature Monitoring

Introducing OSENSA's PWR+ Fiber Optic Temperature Sensing Solutions

The Need for Continuous Monitoring

Overheating caused by overloaded circuits, unbalanced loads, or loose or damaged connections will shorten equipment life, and potentially lead to catastrophic failure. Periodic visual inspections are costly, require special safety considerations and are unlikely to detect these conditions in time.

OSENSA's PWR+ series fiber optic temperature sensors provide continuous monitoring of electrical hot spots in medium voltage switchgear rated up to 38kV.

What is the best technology?

IR (infra-red) sensors are low accuracy, labor intensive to install, require additional mounting brackets and direct line of site to an exposed metallic conductor. They cannot read temperatures directly at bolted connection points or behind insulating boots.

SAW (surface acoustic wave) sensors are expensive, suffer from RF interference and intermittent signal loss which makes installation difficult, and they are fundamentally low accuracy with a limited temperature sensing range.

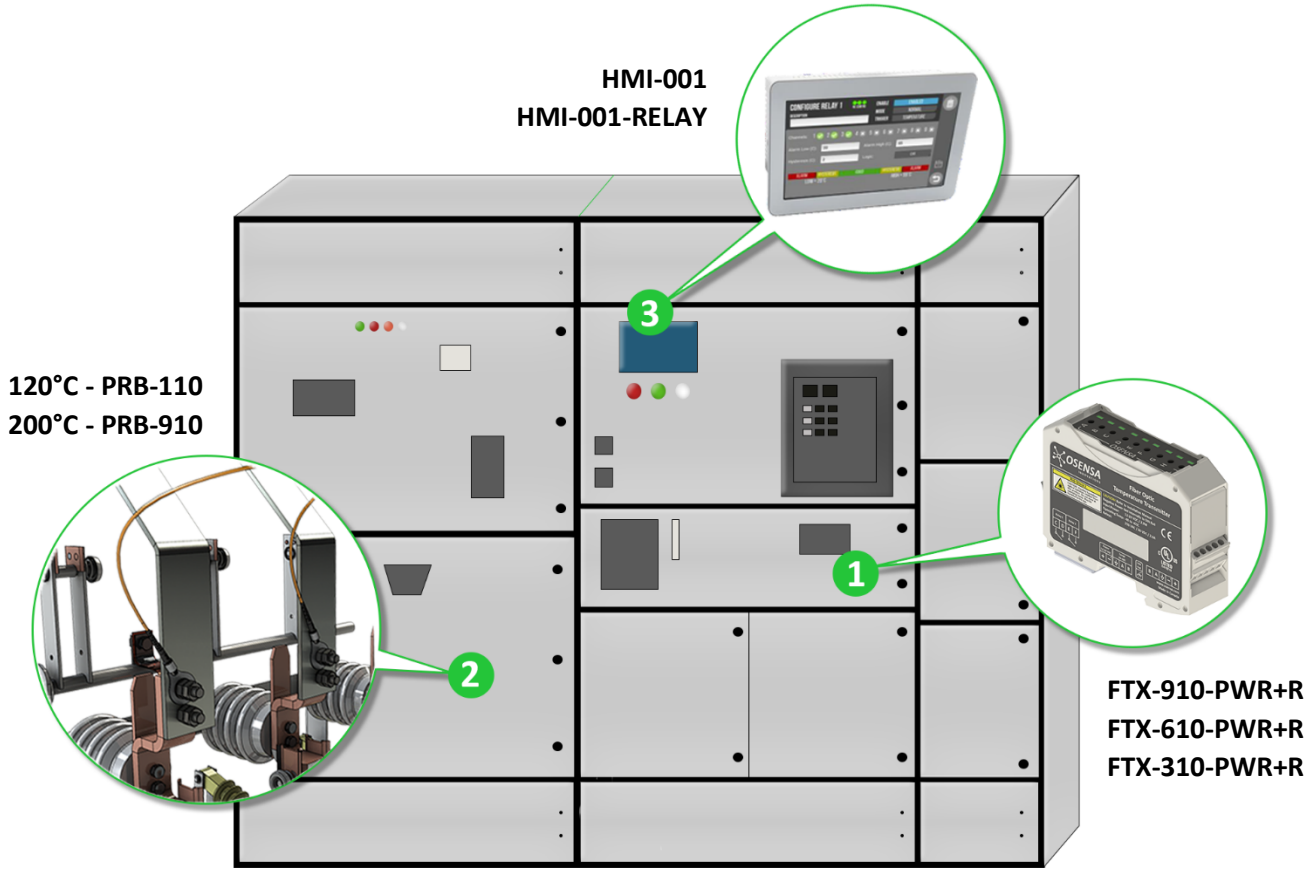
OSENSA's Fiber Optic Sensors are cost effective, high accuracy, easy to install, extremely reliable, and proven to safely monitor any location including the bolted connections of energized conductors.

	IR	*SAW*	*OSENSA*
COST	High	High	Low
ACCURACY	Poor	Poor	Excellent
EASE OF INSTALLATION	Difficult	Difficult	Easy
LONG TERM RELIABILITY	Good	Poor	Excellent

What components do OSENSA's PWR+ solutions include?

1. **Temperature Transmitter** – FTX-910/610/310-PWR+R
2. **Temperature Probes with Fasteners** – PRB-110, PRB-910
3. **Display and Control Module** – HMI-001, HMI-001-RELAY

Introducing OSENSA's PWR+ Fiber Optic Temperature Sensing Solutions



1 Temperature Transmitters (Signal Conditioners)

- Choose between 9, 6 or 3 fiber optic temperature sensor inputs with the FTX-910-PWR+R, FTX-610-PWR+R, or FTX-310-PWR+R temperature transmitters.
- Configure 2 programmable 2.0 Amp, 250 VAC form A relay outputs for warning and trip alarms.
- Power with 12 to 24 VDC at 2.5 W
- 3.5kV isolated Modbus RTU over RS-485 serial communications
- Certifications include CE, UL, and ROHS

Introducing OSENSA's PWR+ Fiber Optic Temperature Sensing Solutions

OSENSA INNOVATIONS

2 Temperature Probes

Install onto existing bolted connections with 1/4", 3/8" or 1/2" standard ring lug sizes.

Provide reliable 24/7 thermal monitoring with noise-free performance.

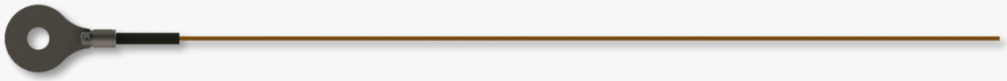
Simply route and cut to the fiber probe to length at time of installation with the supplied cutter. No polishing, no connectors, no special tools or training are required.

Probes are made from highly durable plastic optical fiber that will not break even if you drive over them with your car.

Constructed from high dielectric strength materials OSENSA's fiber optic probes have been tested to safely operate on equipment rated to 38 kV and exceed, the IEEE C37.23-2003 "IEEE Standard for Metal-Enclosed Bus" standard.

The PRB-110 senses temperatures from -40°C to 120°C and the PRB-910 extends the sensing range up to 200°C.

PRB-110 (120°C max. temperature at ring)



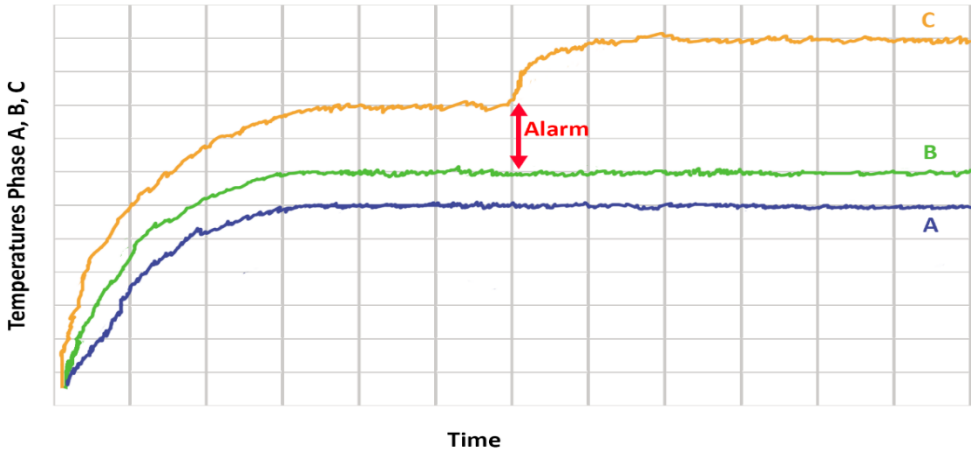
PRB-910 (200°C max. temperature at ring)

Three Types of Alarms

Range Alarms: Set low and high temperature thresholds with hysteresis compensation for both warning and trip alarms. Enable or disable individual channels, apply AND/OR logic operators, and change between Normally Open and Normally Closed operation.

Probe Alarms: Detect and alarm if a probe is disconnected or becomes damaged. Two form A relay contacts on each device can be programmed for various combinations of all three alarm types.

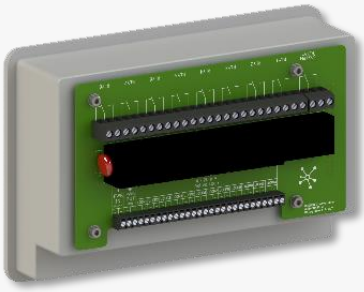
Phase Alarms: Detect and alarm on load imbalances between phases. A 10°C delta between phases can identify a potential issue with motor operation or a load imbalance on a transformer. Catching these issues before they cause a catastrophic failure is critical.



Introducing OSENSA's PWR+ Fiber Optic Temperature Sensing Solutions

3 Display and Control Module

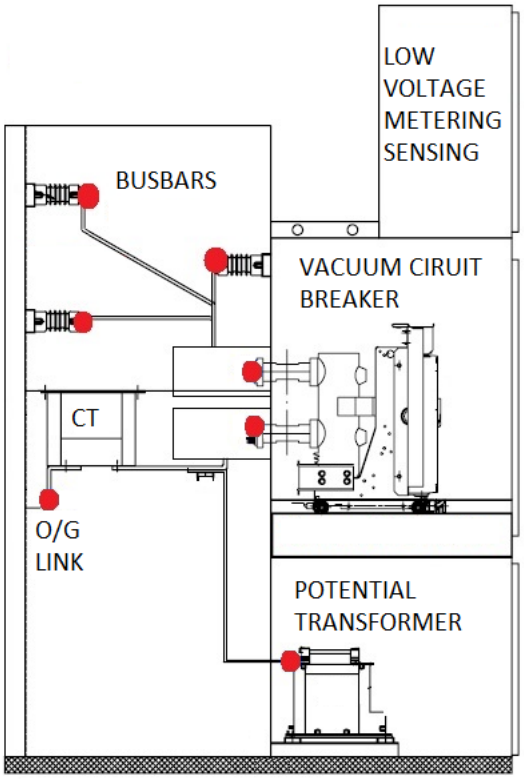
OSENSA's HMI-001 and HMI-001-RELAY touch panel display provides remote ethernet connectivity, real-time display, and data logging for dozens of fiber optic channel inputs. The intuitive interface allows quick and easy configuration with more than 8GB of storage for temperature and event data. The HMI-001-RELAY includes 8 standard user programmable form C relay outputs, one configurable fail-safe system relay, and 12 analog outputs. Standard communications protocols include Modbus RTU, Modbus TCP/IP, DNP3, and IEC-61850.



Monitor Critical Connection Points

Areas of interest for hot spot detection and continuous thermal monitoring include any bolted connection or sliding contact such as:

- **Bus bar joints**
- **Circuit breaker contacts**
- **Ground cable terminations**



Contact Us

OSENSA INNOVATIONS CORP.

www.osensa.com

info@osensa.com
Tel: 1-888-732-0016 (Toll-free Canada/USA)
1-604-259-7177 (International)
Fax: 1-778-355-0796

Office Address
8672 Commerce Ct.
Burnaby, BC, Canada V5A 4N7